COMMUNITY TOOLS AND RESOURCES: WAYS TO MITIGATE THE ADVERSE HEALTH IMPACTS OF WILDFIRE SMOKE

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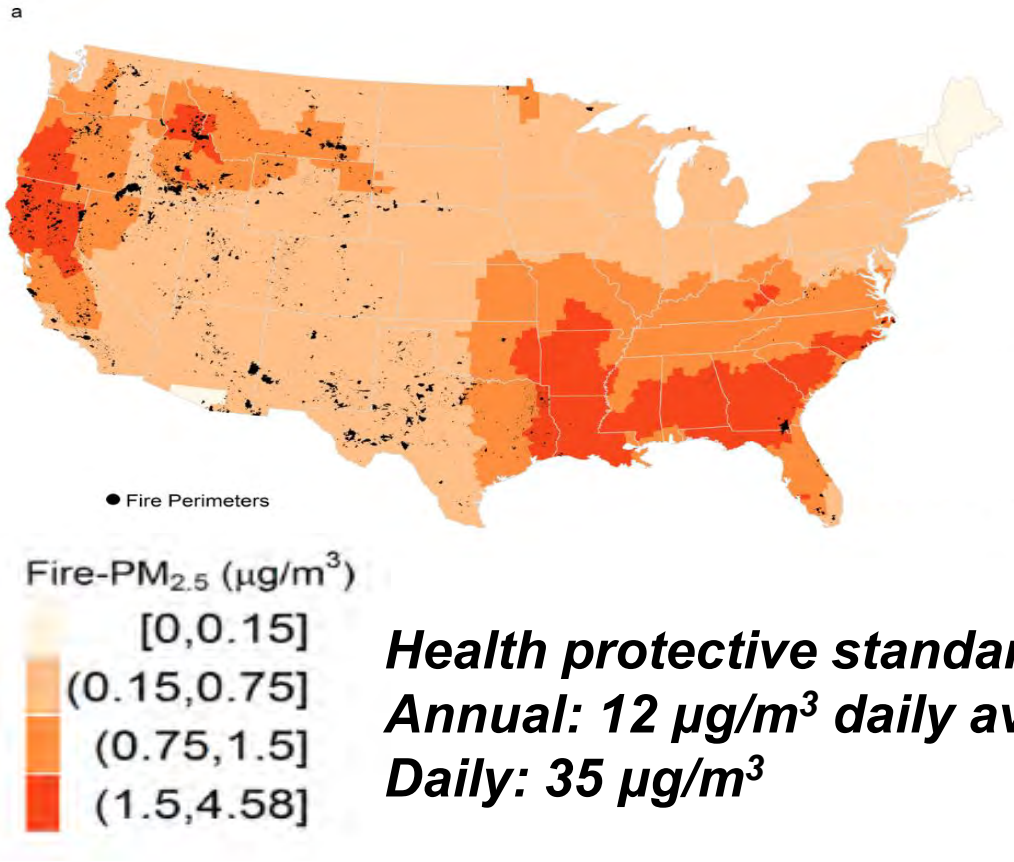
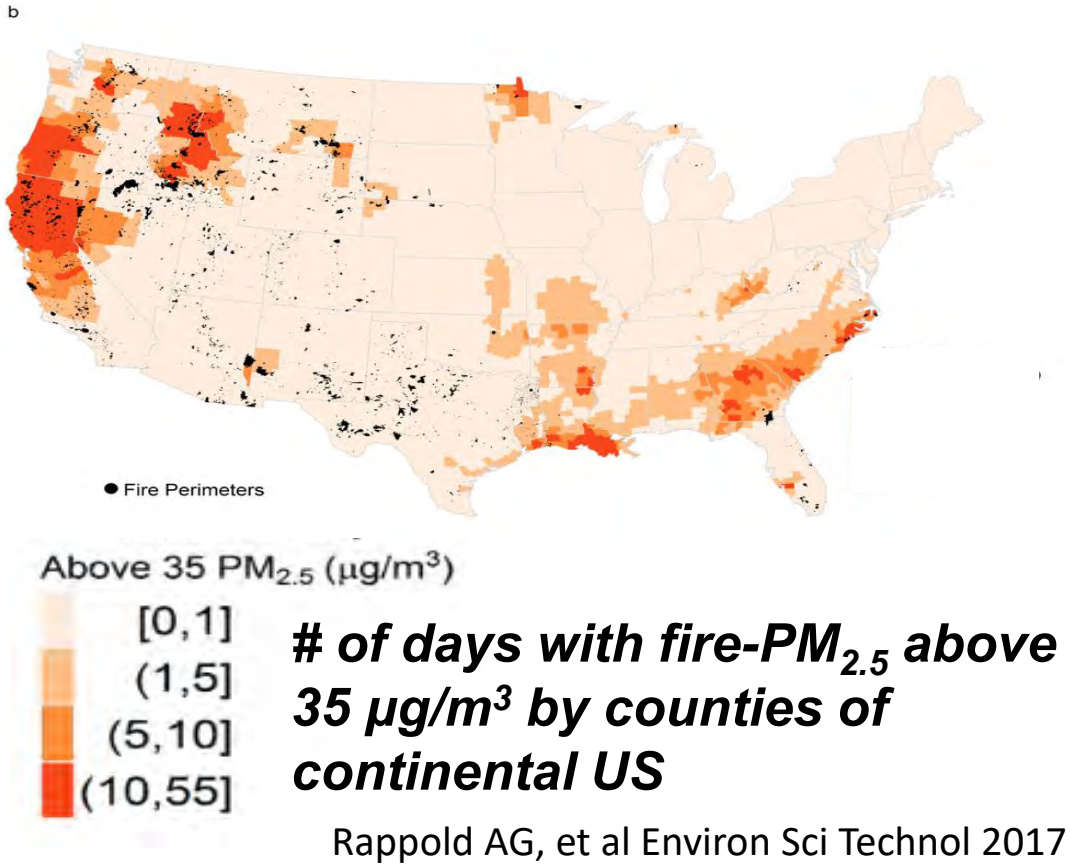
AIR QUALITY IMPACTS OF WILDLAND FIRES

Annual average daily fire-$PM_{2.5}$ footprint for US counties



Health protective standards
Annual: 12 µg/m³ daily avg.
Daily: 35 µg/m³

How much does smoke contribute to air quality and how often does it lead to exceeding daily standard?

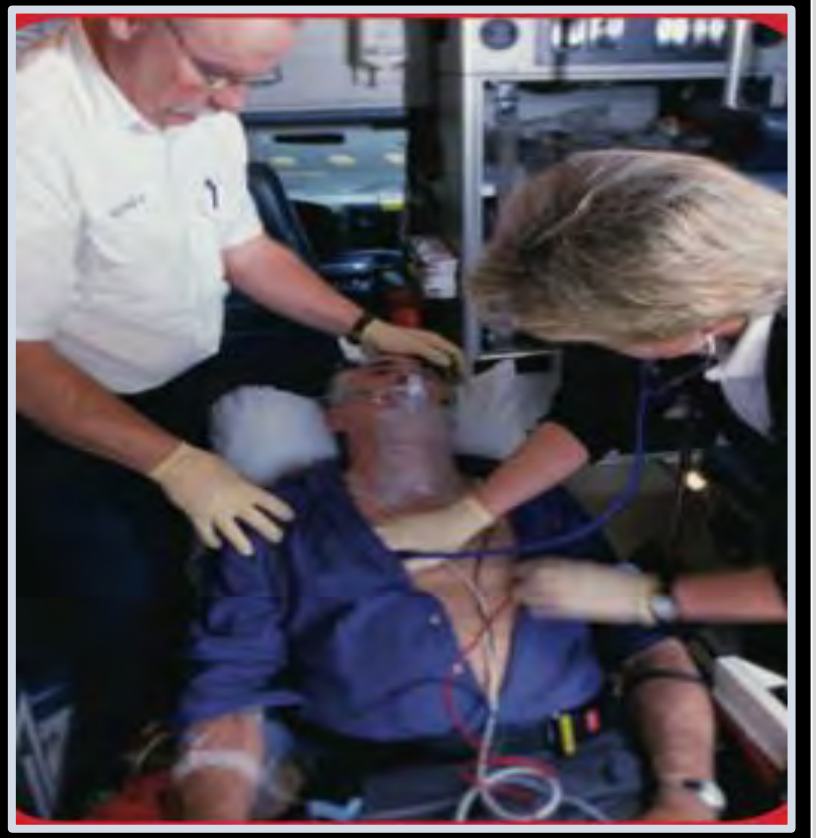


# of days with fire-$PM_{2.5}$ above 35 µg/m³ by counties of continental US

Rappold AG, et al Environ Sci Technol 2017

WILDLAND FIRES & THEIR EMISSIONS

A COSTLY INDIVIDUAL AND PUBLIC HEALTH ISSUE



Estimated Economic Value of Wildfire-Attributed $PM_{2.5}$-Premature Deaths & Respiratory Admissions

Short-term
$10-20 billion/year

Long-term
$76-130 billion/year

Fann N et al. *Science of the Total Environment* 610–611 (2018) 802–809

WILDLAND FIRE SMOKE HEALTH RISKS AND WHO IS MOST AT RISK

Known

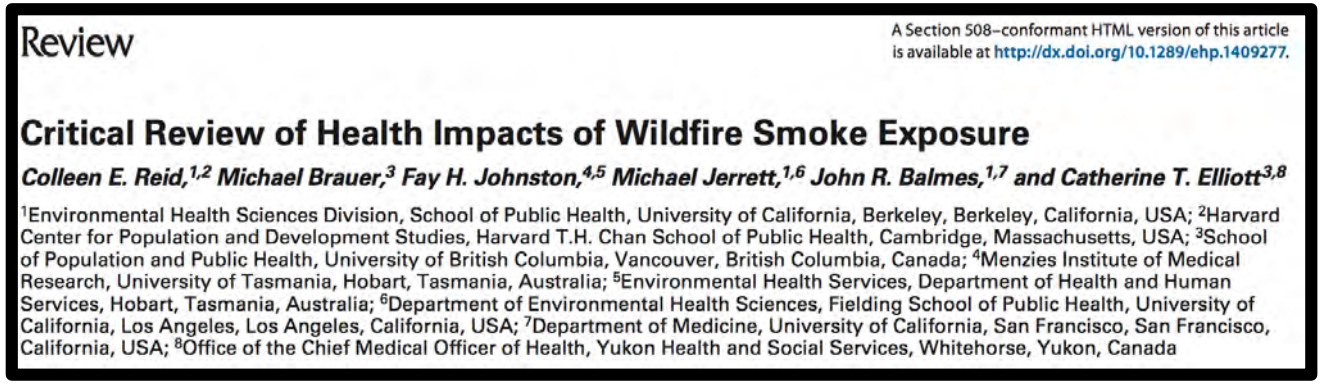
- **Respiratory effects**
  - *Asthma & COPD*
  - *Bronchitis & pneumonia*
- **Susceptible populations**
  - *Children, elders and those with chronic disease*

Suspected

- **All-cause mortality**
- **Cardiovascular effects**
- **Adverse birth outcomes**

More data needed

- **Risk of mortality**
- **Cardiovascular effects**
- **Susceptible populations**



Review

A Section 508–conformant HTML version of this article is available at http://dx.doi.org/10.1289/ehp.1409277.

Critical Review of Health Impacts of Wildfire Smoke Exposure

Colleen E. Reid,[1,2] Michael Brauer,[3] Fay H. Johnston,[4,5] Michael Jerrett,[1,6] John R. Balmes,[1,7] and Catherine T. Elliott[3,8]

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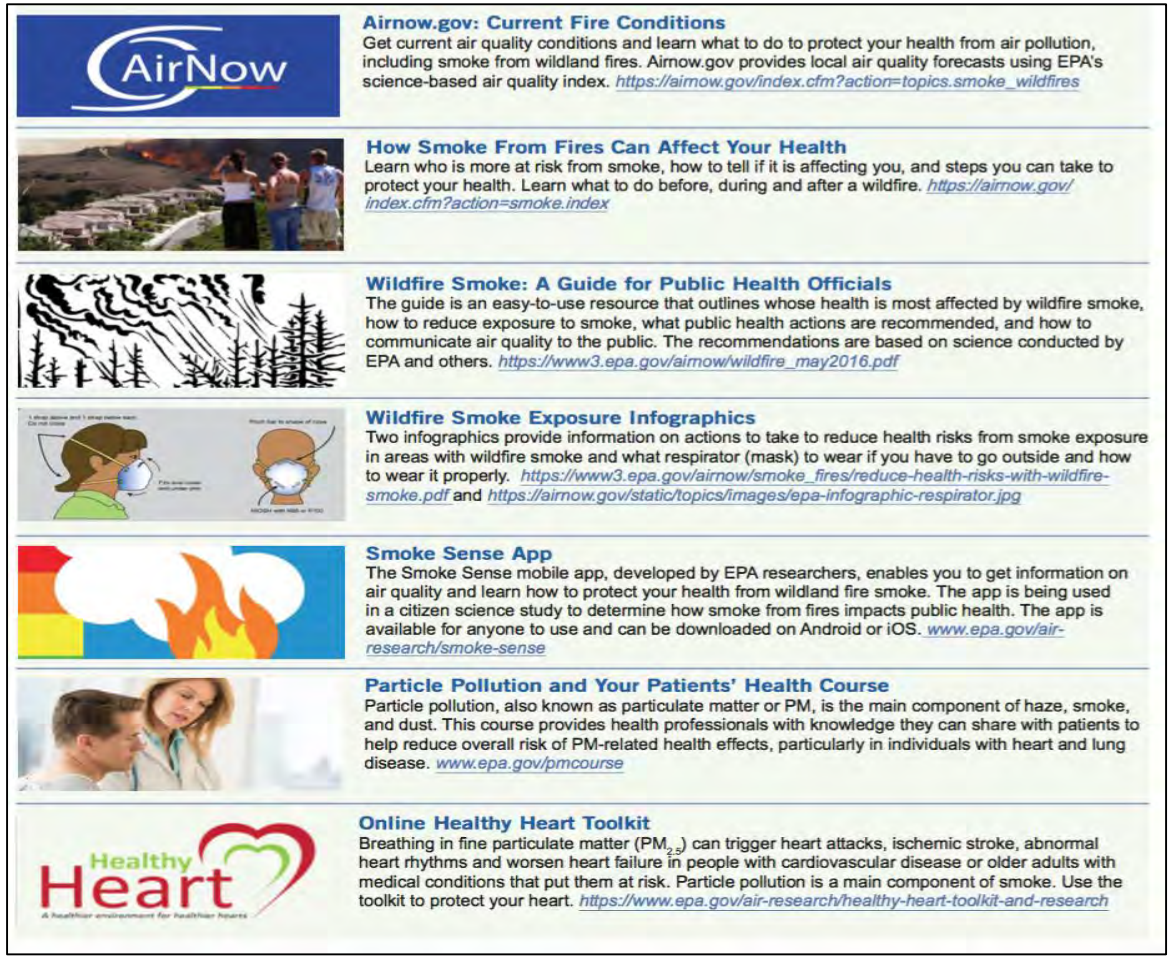
Reid C et al. ***Environ Health Perspectives*** 2016; 124:1334–1343

PRESENTATION STRUCTURE

1. EPA's wildland fire smoke tools and resources
2. Other tools from EPA on air quality and health
3. Future directions for EPA's research and communications on the health effects of wildland fire smoke

SMOKE-READY TOOLBOX FOR WILDFIRES

epa.gov/air-research/smoke-ready-toolbox-wildfires



Airnow.gov: Current Fire Conditions
Get current air quality conditions and learn what to do to protect your health from air pollution, including smoke from wildland fires. Airnow.gov provides local air quality forecasts using EPA's science-based air quality index. https://airnow.gov/index.cfm?action=topics.smoke_wildfires

How Smoke From Fires Can Affect Your Health
Learn who is more at risk from smoke, how to tell if it is affecting you, and steps you can take to protect your health. Learn what to do before, during and after a wildfire. https://airnow.gov/index.cfm?action=smoke.index

Wildfire Smoke: A Guide for Public Health Officials
The guide is an easy-to-use resource that outlines whose health is most affected by wildfire smoke, how to reduce exposure to smoke, what public health actions are recommended, and how to communicate air quality to the public. The recommendations are based on science conducted by EPA and others. https://www3.epa.gov/airnow/wildfire_may2016.pdf

Wildfire Smoke Exposure Infographics
Two infographics provide information on actions to take to reduce health risks from smoke exposure in areas with wildfire smoke and what respirator (mask) to wear if you have to go outside and how to wear it properly. https://www3.epa.gov/airnow/smoke_fires/reduce-health-risks-with-wildfire-smoke.pdf and https://airnow.gov/static/topics/images/epa-infographic-respirator.jpg

Smoke Sense App
The Smoke Sense mobile app, developed by EPA researchers, enables you to get information on air quality and learn how to protect your health from wildland fire smoke. The app is being used in a citizen science study to determine how smoke from fires impacts public health. The app is available for anyone to use and can be downloaded on Android or iOS. www.epa.gov/air-research/smoke-sense

Particle Pollution and Your Patients' Health Course
Particle pollution, also known as particulate matter or PM, is the main component of haze, smoke, and dust. This course provides health professionals with knowledge they can share with patients to help reduce overall risk of PM-related health effects, particularly in individuals with heart and lung disease. www.epa.gov/pmcourse

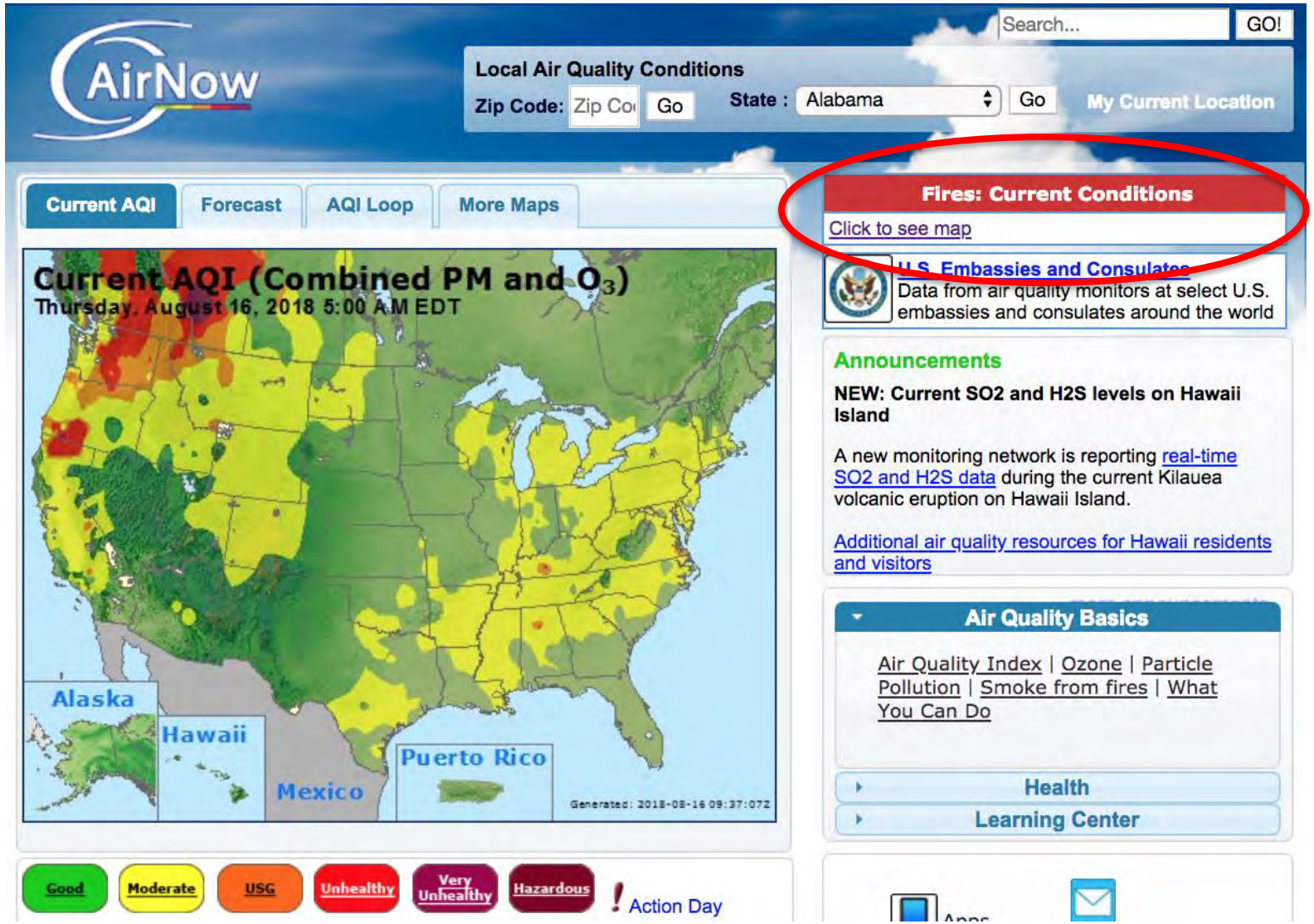
Online Healthy Heart Toolkit
Breathing in fine particulate matter ($PM_{2.5}$) can trigger heart attacks, ischemic stroke, abnormal heart rhythms and worsen heart failure in people with cardiovascular disease or older adults with medical conditions that put them at risk. Particle pollution is a main component of smoke. Use the toolkit to protect your heart. https://www.epa.gov/air-research/healthy-heart-toolkit-and-research

Smoke Ready Toolbox for Wildfires

- **Resources health officials can use to educate the public about the risks of smoke exposure and actions people can take to protect their health**

https://www.epa.gov/sites/production/files/2018-04/documents/smoke_ready_toolbox_for_wildfires_tagged.pdf

AIRNOW.GOV AND THE AIR QUALITY INDEX (AQI)



AQI – National uniform index mandated by Congress

Air Quality Basics

Fires: Current Conditions

AirNow

Local Air Quality Conditions

Zip Code: Go State : Alabama Go National Summary

Go

Forecast | Current AQI | AQI Loop | More Maps

Good | Moderate | USG | Unhealthy | Very Unhealthy | Hazardous | ! Action Day

Fires: Current Conditions

Click to see map

U.S. Embassies and Consulates

corazón, ataques cerebrales y contaminación del aire

more announcements

Air Quality Basics

Air Quality Index | Ozone | Particle Pollution | Smoke from fires | What You Can Do

Health

Learning Center

Apps

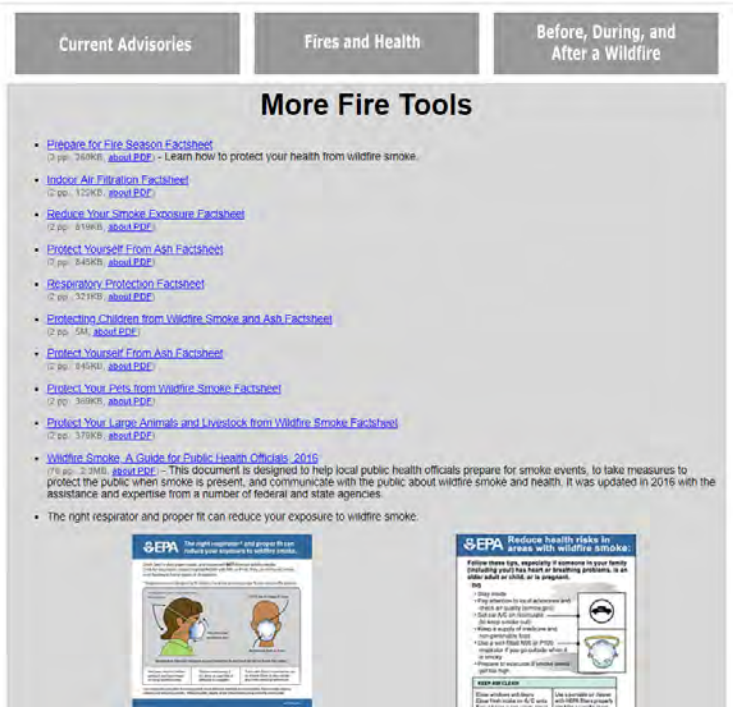
EnviroFlash Email

Fires: Current Conditions

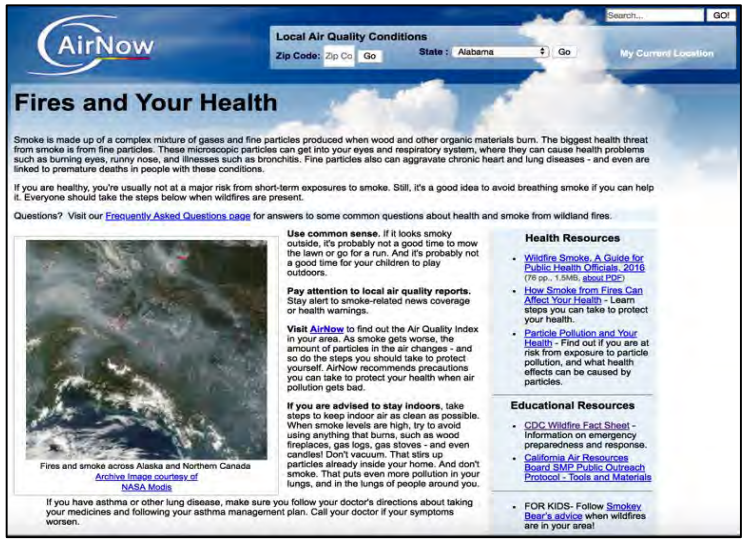
Click to see map

FIRES: CURRENT CONDITIONS PAGE

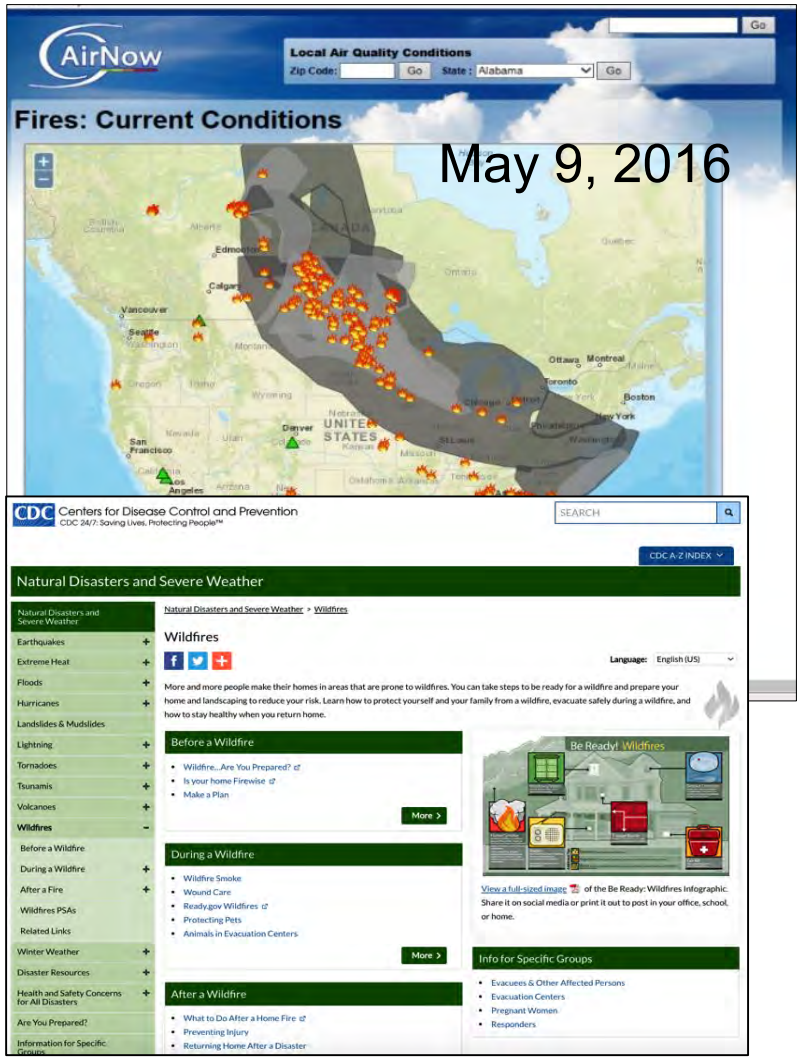
- ***Current Smoke Map generated by NOAA Hazard Mapping System***
- ***Current Advisories – State/Local/Tribal agency blogs***
- ***Wildland Fire Air Quality Response Program***



More Fire Tools

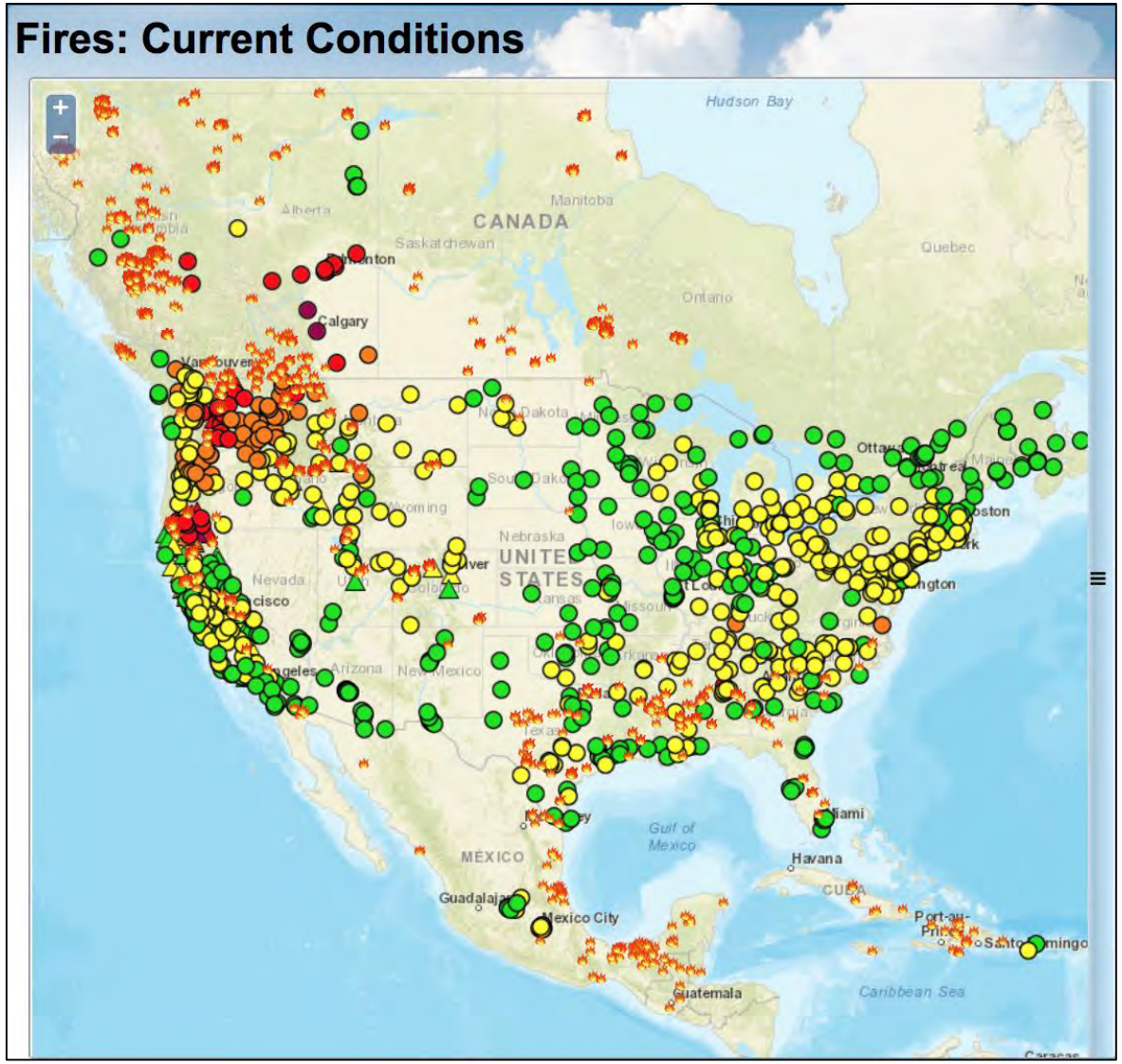


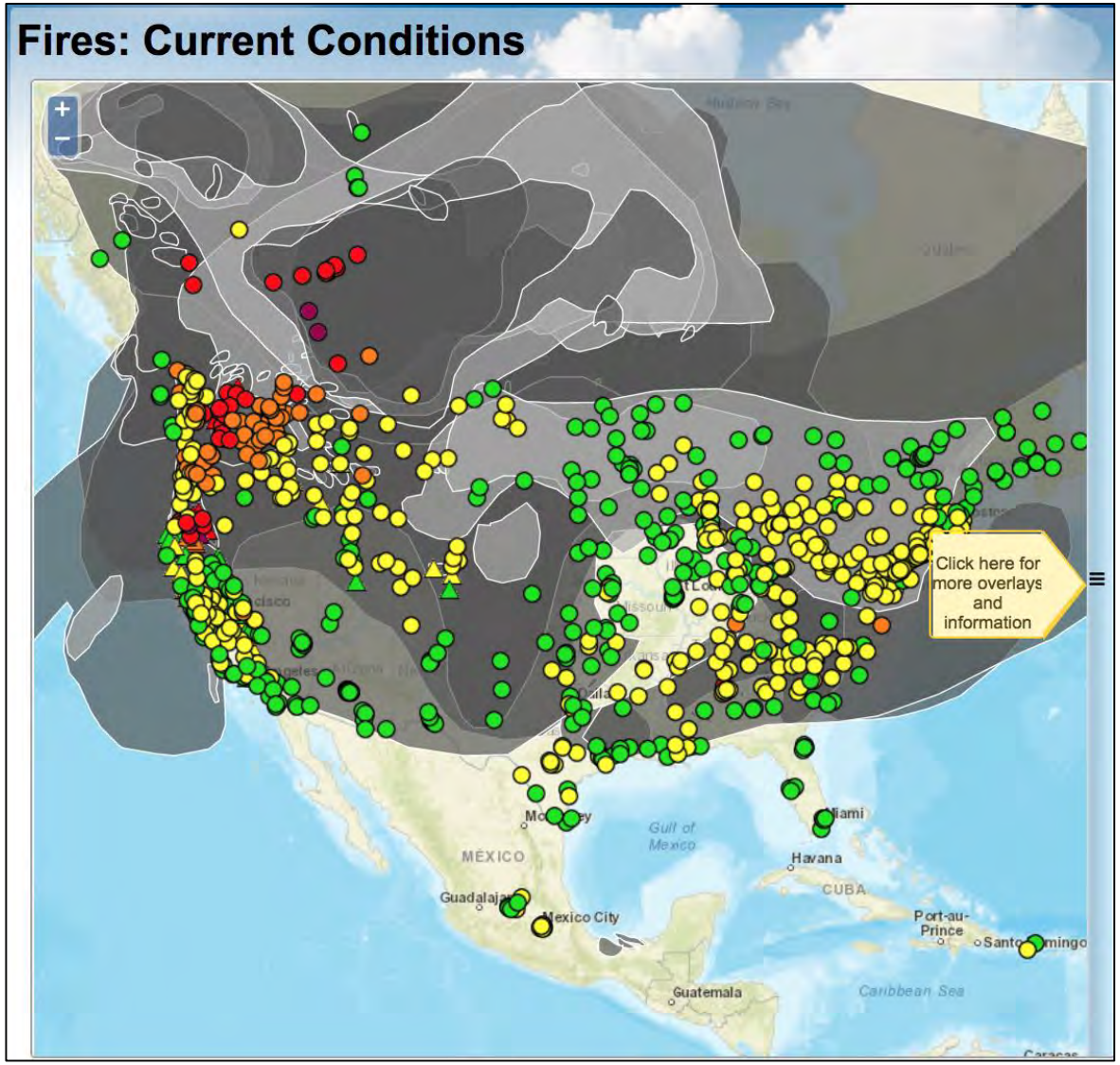
Fires and Your Health



CDC: Before, During & After a Wildfire

FIRES: CURRENT CONDITIONS AUGUST 16, 2018





HOW SMOKE FROM FIRES CAN AFFECT YOUR HEALTH

AirNow

Search... GO!

Local Air Quality Conditions

Zip Code: Zip Cc Go State : Alabama Go My Current Location

How Smoke from Fires Can Affect Your Health

Updated January 2017

Smoke may smell good, but it's not good for you

While not everyone has the same sensitivity to wildfire smoke, it's still a good idea to avoid breathing smoke if you can help it. And when smoke is heavy, such as can occur in close proximity to a wildfire, it's bad for everyone.

Smoke is made up of a complex mixture of gases and fine particles produced when wood and other organic materials burn. The biggest health threat from smoke is from fine particles. These microscopic particles can penetrate deep into your lungs. They can cause a range of health problems, from burning eyes and a runny nose to aggravated chronic heart and lung diseases. Exposure to particle pollution is even linked to premature death.

Some people are more at risk

It's especially important for you to pay attention to local air quality reports during a fire if you are

- **a person with heart or lung disease,** such as heart failure, angina, ischemic heart disease, chronic obstructive pulmonary disease, emphysema or asthma.
- **an older adult**, which makes you more likely to have heart or lung disease than younger people.
- **caring for children, including teenagers,** because their respiratory systems are still developing, they breathe more air (and air pollution) per pound of body weight than adults, they're more likely to be active outdoors, and they're more likely to have asthma.
- **a person with diabetes,** because you are more likely to have underlying cardiovascular disease.
- **a pregnant woman,** because there could be potential health effects for both you and the developing fetus.

How to tell if smoke is affecting you

https://airnow.gov/index.cfm?action=smoke.index

WILDFIRE SMOKE GUIDE

ANTICIPATE AVAILABILITY LATE SUMMER/FALL

- ***Updated look***
- ***Smoke vs urban particles***
- ***Addition of ozone***
- ***Add sections***
  - PM web course
  - Ash clean-up
  - Sensors

- ***Stand-alone fact sheets***
  - Children
  - Older adults
  - Pets/livestock
  - Preseason preparedness
  - Exposure reduction
  - Know when to evacuate
  - Respirator use

WILDFIRE SMOKE GUIDE: FACTSHEETS

FACT SHEETS BEING RELEASED AS APPROVED

WILDFIRE SMOKE FACTSHEET

Prepare for Fire Season

If you live in an area where the wildfire risk is high, take steps now to prepare for fire season. Being prepared for fire season is especially important for the health of children, older adults, and people with heart or lung disease.

Before a Wildfire

- **If any family member has heart or lung disease, including asthma,** check with your doctor about what you should do during smoke events. Have a plan to manage your condition.
- **Stock up** so you don't have to go out when it's smoky. Have several days of medications on hand. Buy groceries that do not need to be refrigerated or cooked because cooking can add to indoor air pollution.
- **Create a "clean room"** in your home. Choose a room with no fireplace and as few windows and doors as possible, such as a bedroom. Use a portable air cleaner in the room.
- **Buy a portable air cleaner** before there is a smoke event. Make sure it has high efficiency HEPA filters and it is the right size for the room.
- **Know how you will get alerts** and health warnings, including air quality reports, public service announcements (PSAs), and social media warning you about high fire risk or an active fire.
- **Ask** an air conditioning professional what kind of high efficiency filters to use in your home's system and how to close the fresh-air intake if your central air system or room air conditioner has one.
- **Have a supply of N95 respirators** and learn how to use them. They are sold at many home improvement stores and online.
- **Organize your important items** ahead of time, including financial and personal documents. Know your evacuation routes and where to go if you have to evacuate. Make sure to prepare your children, and consider your pets when making an evacuation plan.

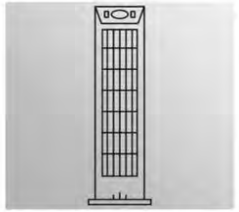
WILDFIRE SMOKE FACTSHEET

Reduce Your Smoke Exposure

When wildfires create smoky conditions, there are things you can do, indoors and out, to reduce your exposure to smoke. Reducing exposure is important for everyone's health — especially children, older adults, and people with heart or lung disease.

Reduce smoke exposure **indoors**

- **Stay inside** with the doors and windows closed. Whether you have a central air conditioning system or a room unit, use high efficiency filters to capture fine particles from smoke. Ask an air conditioning professional what type of high efficiency filter your air conditioner can accept.
- **Seek shelter elsewhere** if you do not have an air conditioner and it is too warm to stay inside with the windows closed.
- **Do not add to indoor air pollution.** Do not burn candles or use gas, propane, wood-burning stoves, fireplaces, or aerosol sprays. Do not fry or broil meat, smoke tobacco products, or vacuum. All of these can increase air pollution indoors.
- **Use a portable air cleaner** to reduce indoor air pollution. Make sure it is sized for the room and that it does not make ozone, which is a harmful air pollutant. Portable air cleaners can be used along with efficient central air systems with efficient filters to maximize the reduction of indoor particles.
- **Create a "clean room"** in your home. Choose a room with no fireplace and as few windows and doors as possible, such as a bedroom. Use a portable air cleaner in the room.
- **Have a supply of N95 respirators** and learn how to use them. They are sold at many home improvement stores and online.
- Long-term smoke events usually have periods when the air is better. When air quality improves, even temporarily, **air out your home** to reduce indoor air pollution.



Use a portable air cleaner to reduce indoor air pollution

WILDFIRE SMOKE FACTSHEET

Protect Your Lungs from Wildfire Smoke or Ash

Wildfire smoke and ash can irritate your eyes, nose, throat, and lungs. They can make you cough or wheeze, and can make it hard to breathe. A respirator is a device (mask) that covers your nose and mouth, fits tightly to your face, and can filter out smoke or ash particles before you breathe them in. Respirators are not sized for children.

Protecting Your Health

The most effective way to protect yourself during wildfire emergencies is to stay indoors or limit your time outdoors when there is smoke in the air. This is especially important if you have heart or lung disease and are at higher risk for adverse health effects. Reducing physical activity and using HEPA-filtered air cleaners indoors are other ways to reduce your smoke exposure. Consider temporary relocation out of the smoky area if possible. By limiting your exposure one of these ways, you may not need to wear a respirator.

Respirators Can Help Protect Your Lungs

N95 or P100 respirators can help protect your lungs from smoke or ash. Straps must go above and below the ears.

How Do I Know if I Need to Wear a Respirator?

- People who stay indoors or limit their time outdoors during wildfire emergencies are doing the most effective thing to avoid exposure and may not need to wear a respirator.
- People who must be outside for extended periods of time in smoky air or an ash-covered area may benefit from using a tight-fitting N95 or P100 respirator to reduce their exposure.
- People experiencing health effects from a smoky environment, even if indoors, may also benefit from using a tight-fitting respirator to reduce their exposure.
- For people who want to wear a respirator, learning how to select and correctly use the respirator is important for achieving the most protection possible.

WILDFIRE SMOKE GUIDE: FACTSHEETS

FACT SHEETS BEING RELEASED AS APPROVED

WILDFIRE SMOKE FACTSHEET

Indoor Air Filtration

When wildfire smoke gets inside your home it can make your indoor air unhealthy, but there are steps you can take to protect your health and improve the air quality in your home. Reducing indoor sources of pollution is a major step toward lowering the concentrations of particles indoors. For example, avoid burning candles, smoking tobacco products, using aerosol products, and avoid using a gas or wood-burning stove or fireplace. Another step is air filtration. This fact sheet discusses effective options for filtering your home's indoor air to reduce indoor air pollution.

Filtration Options

There are two effective options for improving air filtration in the home: 1) upgrading the central air system filter, and 2) using high efficiency portable air cleaners. Before discussing filtration options, it is important to understand the basics of filter efficiency.

Filter Efficiency

The most common industry standard for filter efficiency is the Minimum Efficiency Reporting Value, or "MERV rating." The MERV scale for residential filters ranges from 1 through 20. The higher the MERV rating the more particles are captured as the air passes through the filter. Higher MERV (higher efficiency) filters are especially effective at capturing very small particles that can most affect health.

Central Air System Filter

The filter used in the central heating/cooling system of the home can effectively reduce indoor particle concentrations when the system is operating or when only the fan is turned on. Most home systems use a low MERV (1-4) fiberglass filter that is 1" thick. Replacing this filter with a medium efficiency filter (MERV 5-8) can significantly improve the air quality in your home. Higher efficiency filters (MERV 9-12) will work even better, and a true high efficiency filter (MERV 13-16) can reduce indoor particles by as much as 95 percent. Filters with a High Efficiency Particulate Air (HEPA) rating, (or MERV 17-20) are the most efficient. You may need to consult with a local heating and air technician or the manufacturer of your central air system to confirm which (or if) high efficiency filters will work with your system. If you can't switch to a more efficient filter, running the system continuously by switching the thermostat fan from "Auto" to "On" has been shown to reduce particle concentrations by as much as 24 percent.

Portable Air Cleaners

Portable air cleaners are self-contained air filtration appliances that can be used alone or with enhanced central air filtration to effectively remove particles. How well they reduce air particle concentrations depends on several factors such as the size of the air cleaner, the area to be cleaned, the filter efficiency, how frequently the unit is turned on and the fan speed. Portable air cleaners fitted with high efficiency filters can reduce indoor particle concentrations by as much as 85 percent. Furthermore, portables can be operated continuously at a lower cost compared to the continuous operation of a central system.

EPA United States Environmental Protection Agency | PEHSU Pediatric Environmental Health Specialty Units | American Academy of Pediatrics DEDICATED TO THE HEALTH OF ALL CHILDREN®

WILDFIRE SMOKE FACTSHEET

Protecting Children from Wildfire Smoke and Ash

Background

- Children are especially at risk for health effects from exposure to wildfire smoke and ash, mostly because their lungs are still growing.
- Wildfire concerns include the fire itself, the smoke and ash, and the chemicals from materials that have burned, such as furniture.
- Smoke can travel hundreds of miles from the source of a fire. Pay attention to local air quality reports during fire season, even if no fire is nearby.

Health Effects from Wildfire Smoke and Ash

- Children who breathe in wildfire smoke and ash can have chest pain and tightness; trouble breathing; wheezing; coughing; nose, throat, and eye burning; dizziness; or other symptoms.
- Children with asthma, allergies, or chronic health issues may have more trouble breathing when smoke or ash is present.

Preparing for Wildfires

- Pay attention to local air quality reports. Stay alert to smoke-related news coverage and public health advisories.
- Look up your local Air Quality Index (AQI) on the AirNow (www.airnow.gov) web site.
- If Enviroflash is available for your area, sign up for air quality alerts. (http://www.enviroflash.info/).
- Create a "clean room" in your home. Choose a room with few windows and doors. Buy a portable air cleaner you can use in this room. Never use an ozone-generating air cleaner.
- Stock up on food, medicine and child care supplies before the threat of a wildfire.
- Remember that you may need to leave your home. Plan for it and prepare your children.

During Wildfires

- Continue to listen to local reports and public health warnings.
- Keep children indoors with the doors and windows closed. Use your "clean room". If you have an air conditioner, run it with the fresh-air intake closed to keep outdoor smoke from getting indoors. Use your portable air cleaner as well. Reduce health risks by avoiding strenuous activities.
- Keep the indoor air as clean as possible. Do not smoke. Do not use gas, propane, or wood-burning stoves, fireplaces, or candles. Never use ozone-generating air cleaners. Never use natural gas or gasoline-powered generators indoors. Do not use spray cans. Do not fry or broil meat. Do not vacuum. All of these can lead to poor air quality.
- A good time to open windows to air out the house and clean away dust indoors is once air quality improves (check AirNow for updates).
- Use common sense to guide your child's activity. If it looks or smells smoky outside, if local air quality is reported as poor, or if local officials are giving health warnings, wait until air quality improves before your family is active outdoors.

WILDFIRE SMOKE FACTSHEET

Protect Yourself from Ash

Protect yourself from harmful ash when you clean up after a wildfire. Cleanup work can expose you to ash and other products of the fire that may irritate your eyes, nose, or skin and cause coughing and other health effects. Ash inhaled deeply into lungs may cause asthma attacks and make it difficult to breathe.

Ash is made up of larger and tiny particles (dust, dirt, and soot). Ash deposited on surfaces both indoors and outdoors can be inhaled if it becomes airborne when you clean up. Ash from burned structures is generally more hazardous than forest ash.

Avoid Ash Exposure

Avoid direct contact with ash. If you get ash on your skin, in your eyes, or in your mouth, wash it off as soon as you can.

People with heart or lung disease, including asthma, older adults, children, and pregnant women should use special caution around ash.

Children and pets: Children should not be nearby while you clean up ash. Do not allow children to play in ash. Clean ash off all children's toys before use. Clean ash off pets and other animals. Keep pets away from contaminated sites.

Recommended Actions

Clothing: Wear gloves, long-sleeved shirts, long pants, shoes and socks to avoid skin contact. Goggles are also a good idea Contact with wet ash can cause chemical burns or skin irritation. Change your shoes and clothing before you leave the cleanup site to avoid tracking ash offsite, into your car, or other places.

Use an N95 respirator and avoid skin contact with ash.

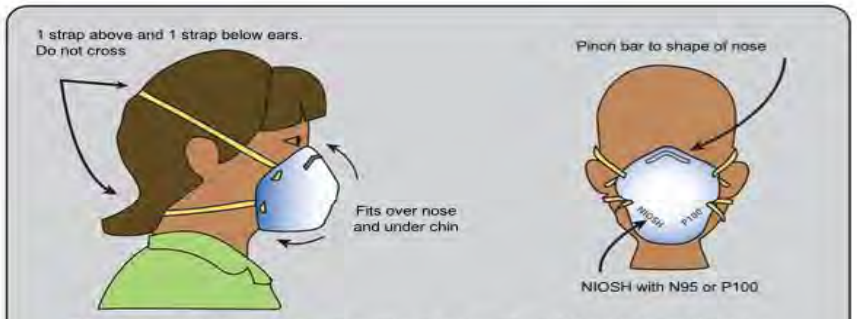
Protecting your lungs: Wear a tight-fitting respirator that filters ash particles from the air you breathe to help protect your lungs. Select a respirator that has been tested and approved by NIOSH and has the words "NIOSH" and either "N95" or "P100" printed on it. These have two straps and are available online, and at many hardware stores and pharmacies. Buy respirators in a size that can be tightened over your mouth and nose with a snug seal to your face. Surgical masks and one-strap dust masks will *not* protect your lungs. They are not designed to seal tightly to the face. If you have heart or lung disease talk to your doctor before using a respirator or working around ash.

HOW TO USE A RESPIRATOR CORRECTLY: FACTSHEET

EPA The right respirator* and proper fit can reduce your exposure to wildfire smoke.

Cloth (wet or dry), paper masks, and tissues will **NOT** filter out wildfire smoke. Look for respirators (masks) marked NIOSH with N95 or P100. They can be found online, or in hardware, home repair, or drugstores.

* Respirators are not designed to fit children. Facial hair prevents proper fit and reduces effectiveness.



Respirator should collapse as you breathe in and not let air in from the sides.

Ask your doctor before using if you have heart or lung health issues.	Throw mask away if it's dirty or you find it difficult to breathe.	If you are dizzy or nauseous, go to where there is less smoke and seek medical attention.

Use a respirator only after first trying other, more effective methods to avoid smoke. That includes staying indoors and reducing activity. When possible, people at risk should move away from the smoke area.

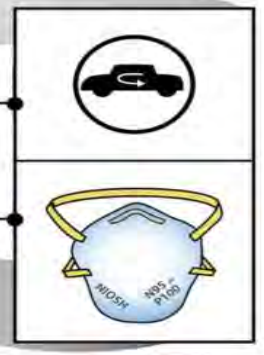
airnow.gov

EPA Reduce health risks in areas with wildfire smoke:

Follow these tips, especially if someone in your family (including you!) has heart or breathing problems, is an older adult or child, or is pregnant.

DO

- Stay inside
- Pay attention to local advisories and check air quality (airnow.gov)
- Set car A/C on recirculate (to keep smoke out)
- Keep a supply of medicine and non-perishable food
- Use a well-fitted N95 or P100 respirator if you go outside when it is smoky
- Prepare to evacuate if smoke levels get too high



KEEP AIR CLEAN	
Close windows and doors. Close fresh intake on A/C units. If your home is too warm, try to stay with friends or relatives.	Use a portable air cleaner with HEPA filters properly sized for a specific room.

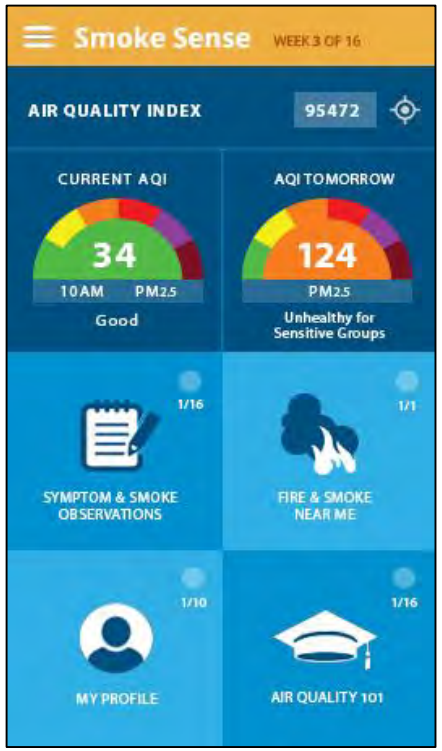
DON'T

- **X** Play or exercise outdoors
- **X** Fry or broil foods, which can add particles to indoor air
- **X** Use a fireplace, gas logs or gas stove
- **X** Smoke indoors
- **X** Vacuum, it can stir up dust

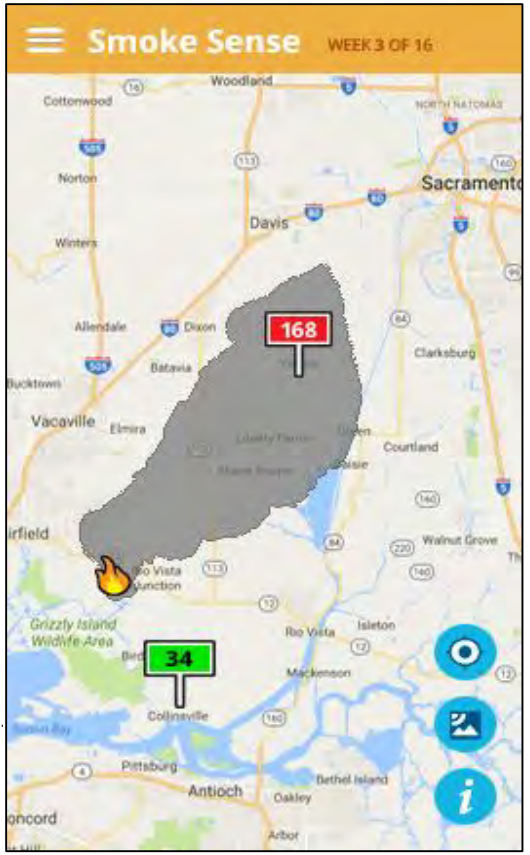
airnow.gov

CITIZEN SCIENCE: AIR QUALITY AND SMOKE PLUME INFORMATION

SMOKE SENSE

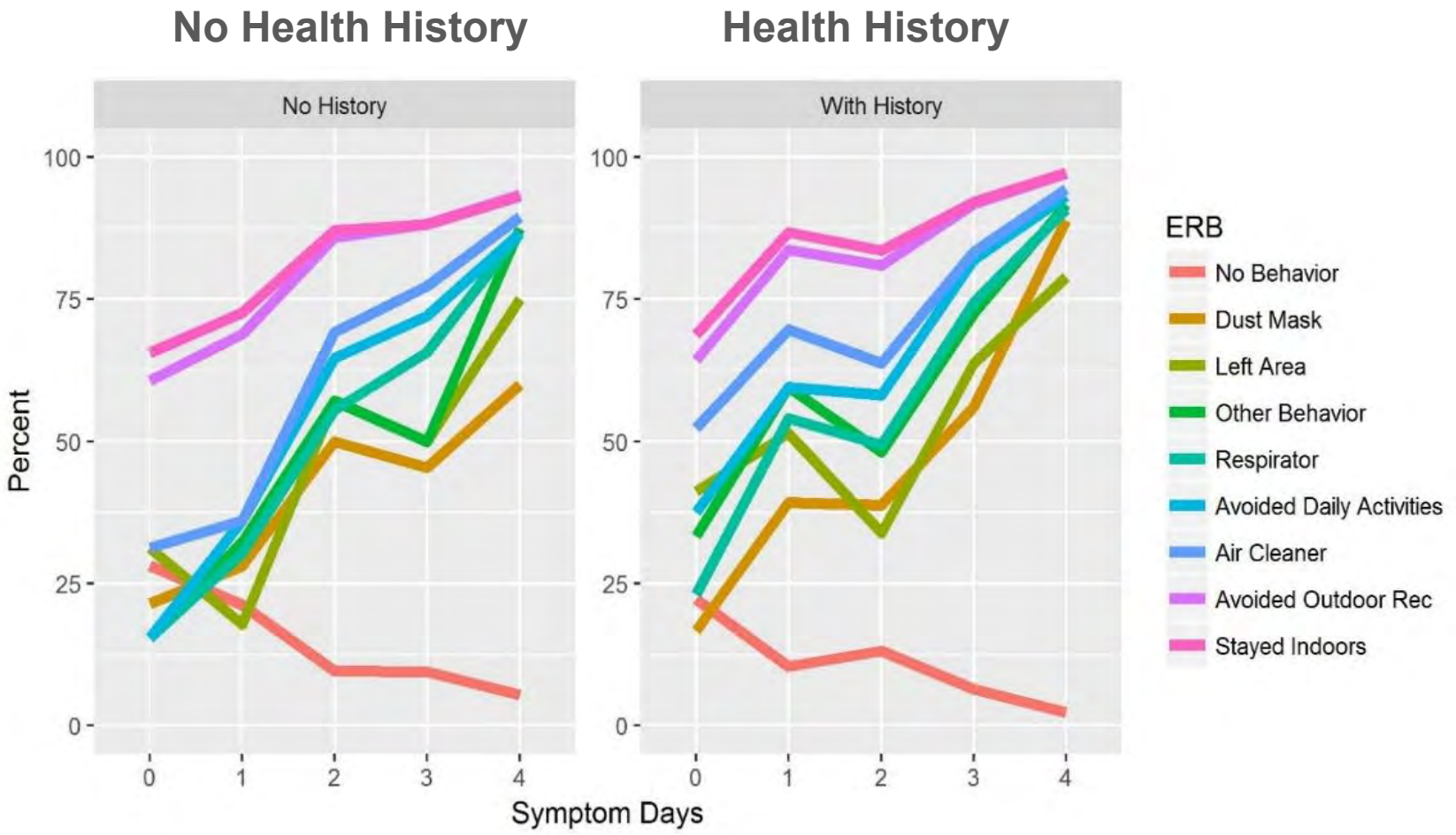


- ***Smoke Sense provides information about current and future air quality***
- ***Forecasted smoke plumes can be visualized***
- ***Less time outside during smoke episodes to decrease exposure, & protect health***
- ***Smoke Sense helps collect information about who, when, and how frequently people are impacted by smoke***
- ***Information about smoke in the air and symptoms experienced in the past week will be logged***



CITIZEN SCIENCE: SMOKE SENSE AND EXPOSURE-REDUCING BEHAVIORS

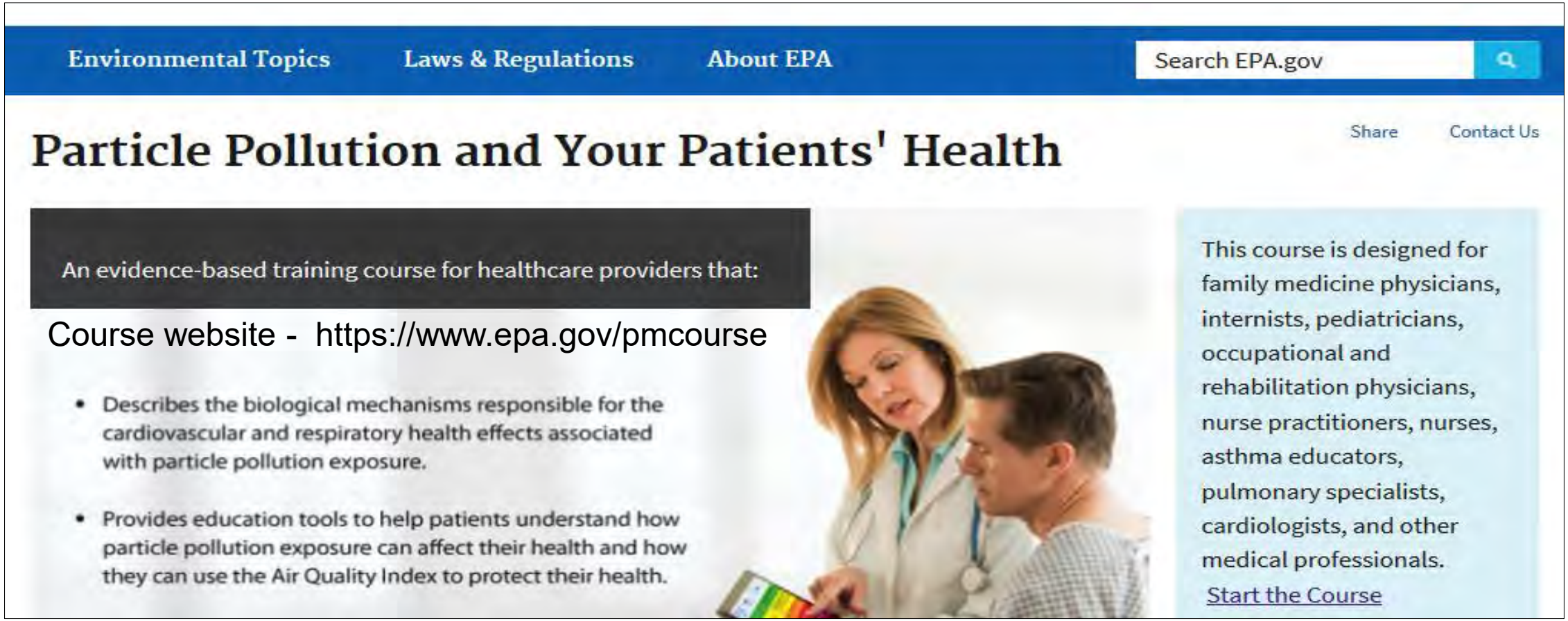
- ***Smoke Sense had >23,000 users and 100,000 sessions in 2017, with a 92% return rate***
- ***User-provided information enables analysis of symptoms and exposure-reducing behaviors***
- ***While 91% of users believe that smoke exposure affects health, exposure-reducing behaviors do not depend on health history and do not occur until after multiple days of exposure***
- ***Indicates that behaviors are reactive not proactive***



OTHER EPA INITIATIVES: PARTICULATE MATTER WEB COURSE

FOR HEALTHCARE PROFESSIONALS AND EDUCATORS

CME credit from CDC to physicians, nurses and health educators



PARTICLE POLLUTION AND YOUR PATIENTS' HEALTH

CONTINUING EDUCATION COURSE CONTENT

- What is Particle Pollution?
- **Respiratory Effects**
- Cardiovascular Effects
- **Patient Exposure and High Particle Pollution Events**
- Clinical Scenarios
- Patient Education Tools

EPA'S HEALTHY HEART PROGRAM

INCREASING ENVIRONMENTAL HEALTH LITERACY

EPA's Healthy Heart program aims to prevent heart attacks and strokes by:

- Raising public awareness about the role outdoor air pollution plays in cardiovascular health, and
- Steps individuals can take to reduce their pollution exposure

http://www.epa.gov/healthyheart/

PARTNERING WITH MILLION HEARTS®

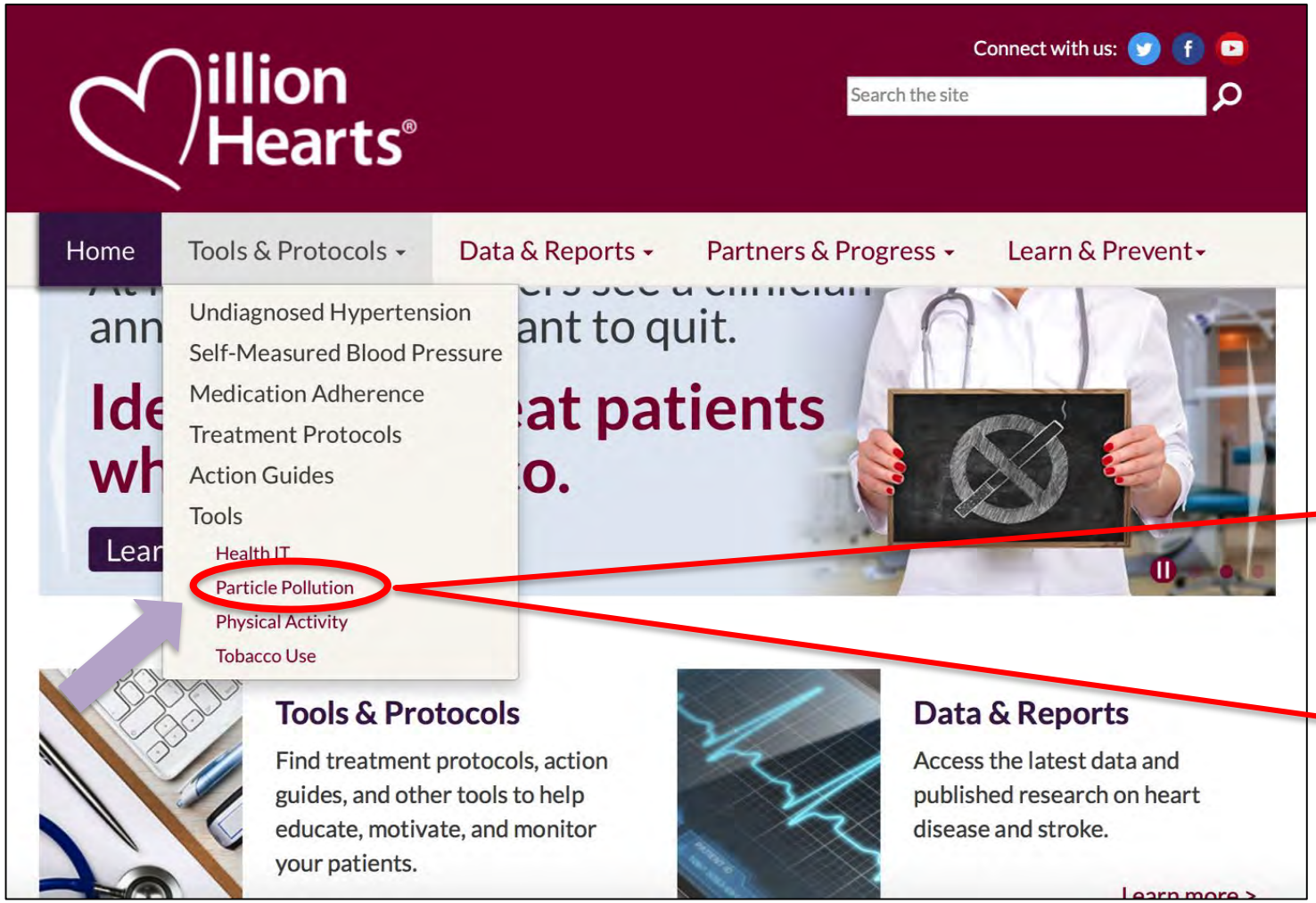
JOINT INITIATIVE OF CDC AND CENTERS FOR MEDICARE AND MEDICAID SERVICES

*EPA's contributes the **Healthy Heart** program to Million Hearts in the fight against heart attacks and strokes*

http://millionhearts.hhs.gov/aboutmh/partners/epa.html

EDUCATIONAL TOOLS ON PARTICLE POLLUTION

https://millionhearts.hhs.gov



WILDLAND FIRE SMOKE AND HEALTH

FUTURE DIRECTIONS

- **Do health effects from short-term exposures to high concentrations differ from long-term exposures to low concentrations of smoke?**
- **Do health effects from smoke from wildfire differ from prescribed fire?**
- **Is the toxicity of smoke modified by fuel type or burning conditions, or mixing with urban air pollution?**
- **Is there a concentration at which evacuation should be ordered?**

DOING SOLUTION-DIRECTED SCIENCE

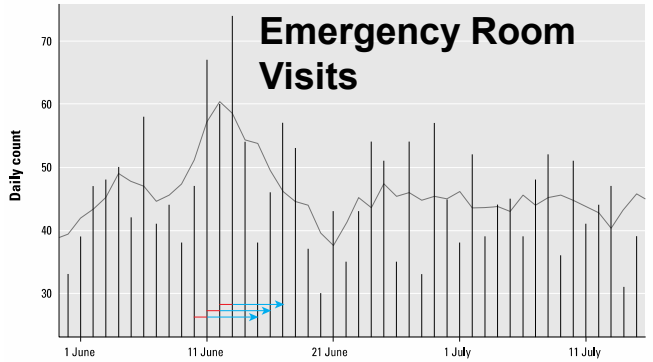
***In Vitro and In Vivo* Testing**
Wildifre PM or emissions
Inhalation or Oropharyngeal Aspiration

MOUSE

Biochemical
Physiological
Pathological

- **Lung injury**
- **Lung inflammation**
- **Cardiac function**

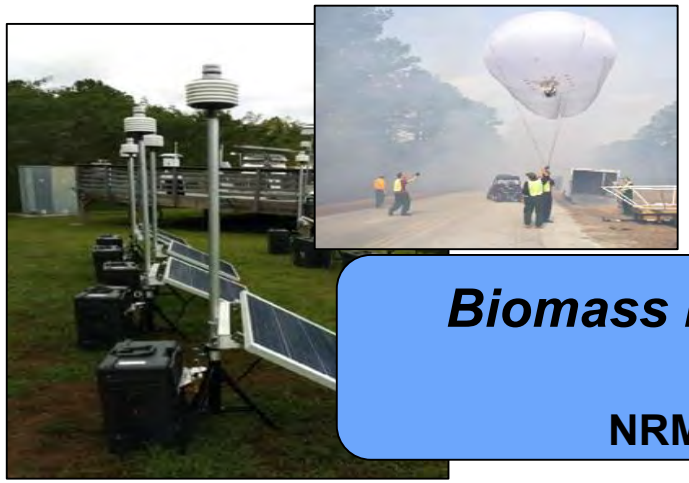
Smoke Toxicology
NHEERL



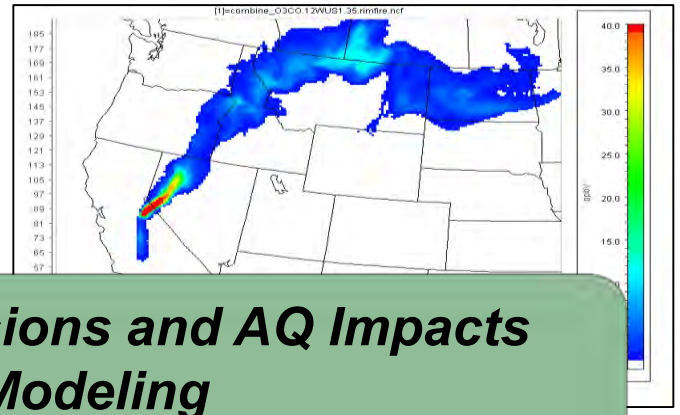
EPA A&E Wildland Fire Research

Smoke Exposure (Monitors/Sensors)
NERL, NRMRL

Smoke Epidemiology and Public Health
NHEERL,OAQPS



FASMEE Initiative w/ OAR-OAQPS



Biomass Emissions Factors & Speciation
NRMRL, OAR-OAQPS

Smoke Emissions and AQ Impacts Modeling
NERL, OAR-OAQPS

WILDLAND FIRE SENSORS CHALLENGE

MULTI-FEDERAL AGENCY CHALLENGE TO PRODUCE A SENSOR CAPABLE OF RAPID DEPLOYMENT AND CONTINUOUS MONITORING OF AIR POLLUTION DURING A FIRE EVENT

First Place Award

Jason Gu (left) and Bryan Tomko of SenSevere/Sensit Technologies in Pittsburgh, Pennsylvania, with R. Subramanian of Carnegie Mellon University, received first place and $35,000.

Second Place Award

Scott Waller (left) and Andrew Smallridge of Thingy LLC, Bellevue, Wash. received second place and $25,000.

PROTECTING POPULATION HEALTH – TRANSLATIONAL SCIENCE

DEVELOP, IMPLEMENT, AND EVALUATE THE IMPACT OF PUBLIC HEALTH COMMUNICATION ON POSITIVELY AFFECTING PROTECTIVE DECISIONS

Evaluate the effectiveness of:

- communication strategies
- interventions to decrease wildfire smoke exposures, and
- lower biomarkers of exposure to wildfire smoke, and
- adverse health outcomes

Translational Pilot Project in Missoula, MT

- Partnering with the local health department to evaluate the use of filtration devices in homes and public buildings
- Create “clean air spaces” in schools, libraries, senior centers, fitness centers

Missoula Public Health
City-County Health Department

CLIMATE SMART
MISSOULA

THANK YOU

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Office of Research and Development
U.S. Environmental Protection Agency

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- No conflicts of interest
- Disclaimer: The presentation represents the opinions of the speaker and does not necessarily represent the policies of the US EPA